

The RSP-MAPP algorithm: coupled ocean/aerosol products retrieved during the NASA SABOR and NAAMES campaigns by the NASA Research Scanning Polarimeter with comparison to collocated LaRC high spectral resolution lidar HSRL-1 ocean/aerosol measurements and ship-based *in situ* measurements

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The recently completed 2015–2017 EVS-2 mission the North Atlantic Aerosols and Marine Ecosystems Study (NAAMES) provides a unique set of airborne remote sensing and ship-based *in situ* measurements in a remote and under-sampled region of the Earth's ocean. The NASA Ship-Aircraft Bio-Optical Research (SABOR) campaign was conducted during the summer of 2014, also in the Atlantic Ocean, out of the Chesapeake Bay and in the eastern coastal region of the United States. For both campaigns, the NASA GISS Research Scanning Polarimeter, a multi-angle, multi-spectral polarimeter measured the upwelling polarized radiances from aircraft. And for both campaigns, ship-based *in situ* measurements of the ocean were collected jointly with the aircraft measurements. We present results from the new RSP-MAPP [1] that is based on optimal estimation and that can retrieve simultaneous aerosol microphysical properties (including effective radius, single-scattering albedo, and real refractive index) and ocean color products using accurate radiative transfer, Mie calculations, and the DP (Detritus Plankton) series of accurate, numerically efficient ocean bio-optical models. The RSP-MAPP algorithm was applied to data collected during SABOR and NAAMES to retrieve aerosol microphysics and ocean products for all Aerosols-Above-Ocean (AAO) scenes. The RSP-MAPP products are compared against (i) collocated aerosol extinction and backscatter profiles collected by the NASA LaRC airborne High Spectral Resolution Lidar HSRL-1, including lidar depth profiles of the ocean diffuse attenuation coefficient and the hemispherical backscatter coefficient, and (ii) collocated ship-based *in situ* measurements of the ocean.

Reference

- [1] Stamnes, S., *et al.*, 2018: Simultaneous polarimeter retrievals of microphysical aerosol and ocean color parameters from the “MAPP” algorithm with comparison to high-spectral-resolution lidar aerosol and ocean products. *Appl. Opt.* **57**, 2394–2413.

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